



SOFTWARE ENGINEERING

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The office of Systems Engineering and Architecture (SE&A) applies engineering expertise to advance software engineering practice in support of the warfighter. SE&A Software Engineering engages with partners in government, industry, and academia to improve defense software expertise and leads initiatives to build excellence and professionalism in the defense software engineering workforce.

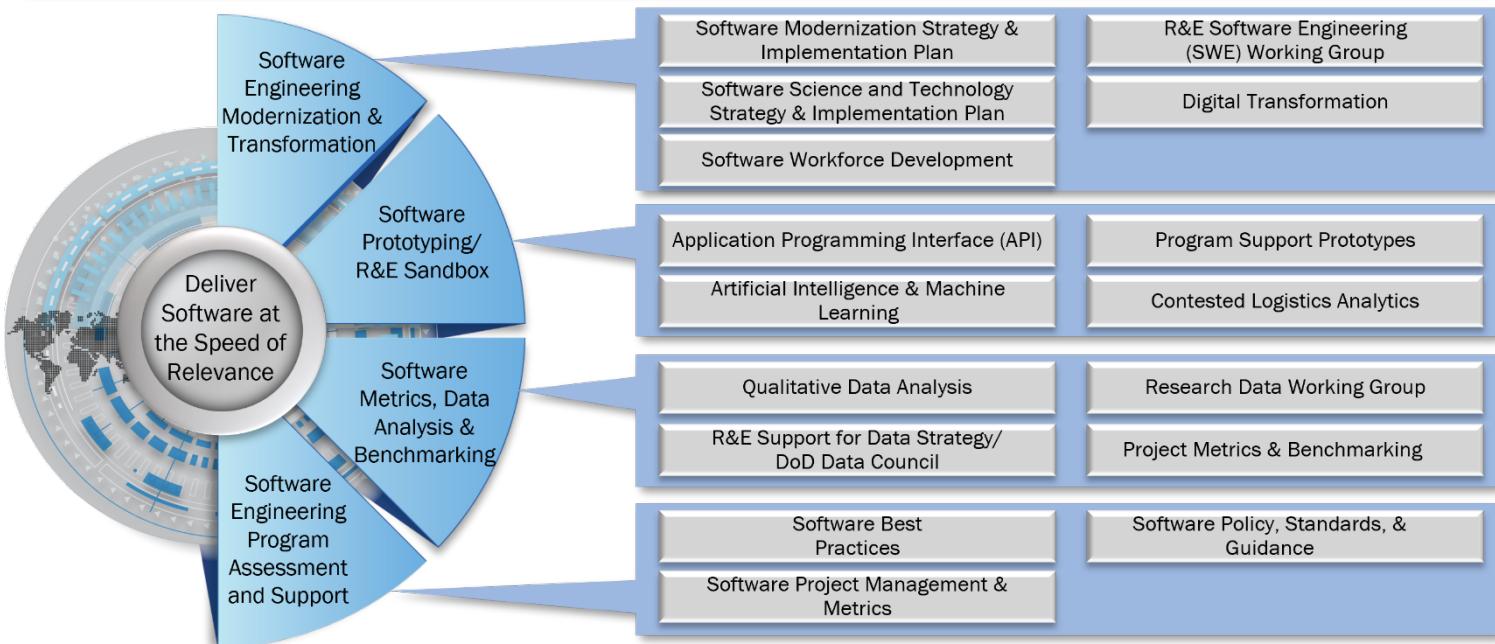


Figure 1. Enabling World-Class Software Engineering, Development, and Delivery

❖ KEY SOFTWARE ENGINEERING INITIATIVES

SE&A Software Engineering seeks to advance Department of War (DoW) software engineering practice with modern approaches (Figure 1). Software Engineering is engaged in two key initiatives:

Application Programming Interface (API) Technical Standards. Interoperability is crucial to joint warfighting, achieving artificial intelligence (AI) superiority, and leveraging modern software architectures and implementations. An API-first strategy will allow the Department to enhance its ability to deliver new and innovative capabilities at the speed of need. The API Tiger Team publishes and updates technical guidance for implementing APIs, including cybersecurity, governance, design, and implementation. For more information, see the [DoD Software Modernization Strategy](#) (November 2021):

Software Science and Technology (S&T) Strategy Implementation. As a follow-on to the strategy, Software Engineering led development of the [DoD S&T Strategy Implementation Plan \(I-Plan\)](#) (August 2024) to coordinate software S&T activities across the Department. The I-Plan facilitates adoption of an integrated framework and aligns software S&T with acquisition.

❖ SOFTWARE WORKFORCE DEVELOPMENT

SE&A Software Engineering manages the Digital Talent Management Forum (DTMF) for the Office of the Under Secretary of War for Research and Engineering (OUSW(R&E)), which tri-chairs the monthly DTMF with OUSW Acquisition and Sustainment (A&S) and the Chief Digital and Artificial Intelligence Office (CDAO). The forum includes more than 400 members from 48 DoW organizations. The DTMF supports the DoD Cyber Workforce Framework (DCWF), for which OUSW(R&E) has led development of eight Software Engineering Work Roles. For more information, see the [DCWF](#) website.



OFFICE OF SYSTEMS ENGINEERING & ARCHITECTURE

ORGANIZATION HIGHLIGHT: SOFTWARE ENGINEERING *continued*

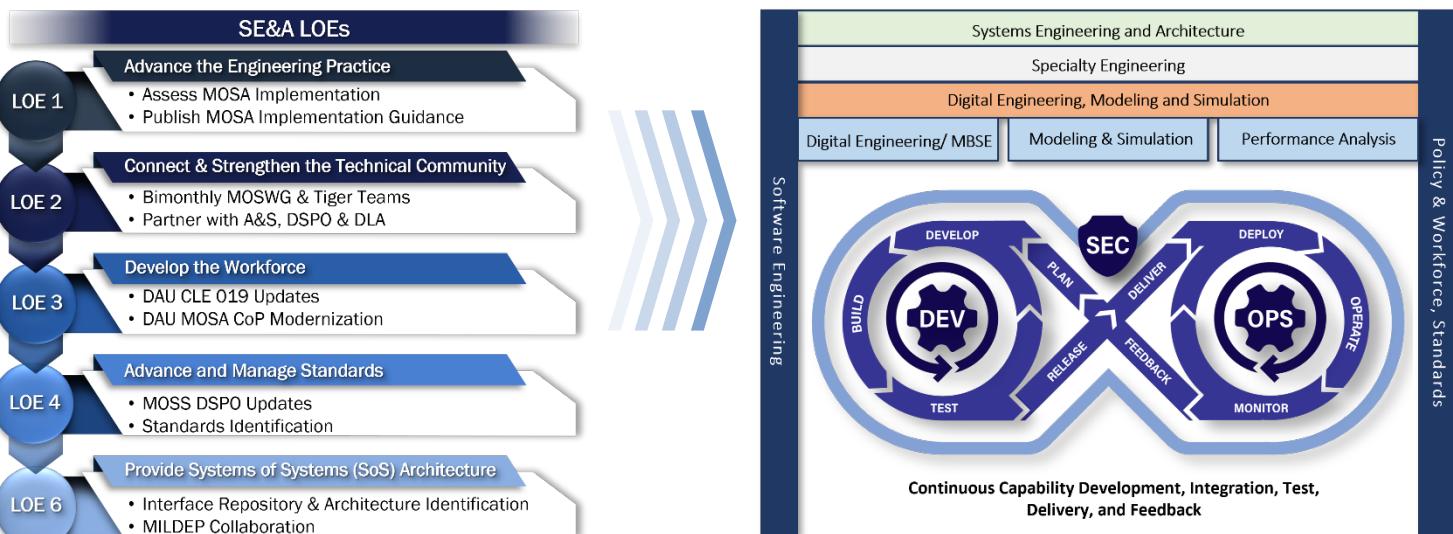


Figure 2. SE&A Lines of Effort Relevant to Software and Systems Engineering

❖ INITIATIVES

SE&A Software Engineering supports SE&A Lines of Effort (LOEs) from a software perspective, as software engineering plays a role in all aspects of program development (Figure 2). SE&A is exploring ways to improve digital engineering and model-based systems engineering (MBSE) and is leading efforts to improve cybersecurity. Teams use parametric modeling, software metric analysis, and data quality analysis to enhance DoW's visibility into contested logistics.

Software engineering enhances efficiency, accuracy, resiliency, and speed.

❖ COLLABORATION

SE&A Software Engineering collaborates with multiple organizations throughout DoW and plays a leading role in the following:

- Digital Talent Management Forum
- DoW Application Programming Interface (API) Tiger Team
- DoW Software S&T Strategy Senior Steering Group
- OUSW(R&E) Engineering Data Working Group
- OUSW(R&E) Software Engineering Working Group
- Software Modernization Action Officer Working Group
- Software Modernization Senior Steering Group
- NATO Application Programming Interface (API) Directive Writing Team.

❖ RESOURCES

OUSW(R&E) SE&A Library: <https://www.cto.mil/sea/pg>

- Software Engineering for Continuous Delivery of Warfighting Capability
- DoD Software Science and Technology Strategy
- Acquisition Programming Interface (API) Technical Guidance

CIO Library: <https://dodcio.defense.gov/library/>

OUSW(R&E) SE&A: <https://www.cto.mil/sea>

DCWF: <https://www.cyber.mil/dod-workforce-innovation-directorate/dod-cyber-workforce-framework/dcwf>

Email: osd-sea@mail.mil | Attn: Software Team

